

Amendments to the Claims:

The listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims

1 (original): A multi-function machine tool comprising:

a main spindle which is rotatably disposed on the bed of the machine tool, and has workpiece attachment means for attaching a workpiece on the tip end thereof;

a tool rest main body which is disposed movably in relative terms in a first linear direction parallel to the axial line of said main spindle, and in a second linear direction perpendicular to said first linear direction;

a turning tool rest which is disposed on said tool rest main body, allows the mounting of a tool, and is disposed so that this tool rest can turn relative to said tool rest main body about a turning axis which has an axial line oriented in a direction that is perpendicular to both said first linear direction and said second linear direction; and

control means for controlling the rotational motion of said main spindle about the axial line of said main spindle, the turning motion of said turning tool rest about the axial line of said turning axis, and the relative motion of said main spindle and said tool rest main body in said first linear direction and said second linear direction;

wherein said control means can cause the turning motion of said turning tool rest about an arbitrary position that differs from the position of said turning axis by concurrently and synchronously causing a turning motion of said turning tool rest about said turning axis, and a

circular-arc motion based on the relative motion of said tool rest main body in said first linear direction and said second linear direction.

2 (original): The multi-function machine tool according to claim 1, wherein said tool rest main body is disposed movably relative to said bed in said first linear direction and said second linear direction.

3 (original): The multi-function machine tool according to claim 1, wherein said control means can accomplish the machining of helical grooves in said workpiece by causing a rotational motion of said workpiece about the axial line of said main spindle concurrently and in synchronization with said turning motion and said circular-arc motion.

4 (currently amended): The multi-function machine tool according to claim 3, wherein a plate-form ~~bite~~ cutting tool as a tool that performs the machining of said helical grooves can be mounted on said turning tool rest.

5 (original): The multi-function machine tool according to claim 3, wherein
a turning tool that performs turning on said workpiece can be mounted on said turning tool rest,
and said control means can perform said helical groove machining and said turning of said workpiece as a continuous process.

6 (original): The multi-function machine tool according to claim 5, wherein said turning tool rest comprises at least a first mounting part which detachably mounts a tool that performs said helical groove machining, and a second mounting part which detachably mounts a turning tool that performs said turning.

7 (original): The multi-function machine tool according to claim 4, wherein a milling tool that performs rough machining of said helical grooves can be mounted on said turning tool rest.

8 (currently amended): The multi-function machine tool according to claim 7, wherein said turning tool rest comprises a rotatable tool main spindle, a tool mounting part is disposed on the tip end portion of said tool main spindle, and said tool mounting part is capable of mounting said milling tool and said plate-form ~~bite~~ cutting tool.

9 (currently amended): the multi-function machine tool according to claim 8, wherein said tool mounting part comprises rotation regulating means that regulate the rotation of said plate-form ~~bite~~ about said tool main spindle when said plate-form ~~bite~~ cutting tool is mounted.

10 (original): The multi-function machine tool according to claim 1, wherein said workpiece attachment means can attach said workpiece in a position that is separated by a specified distance from said main spindle toward the front on the axial line of said main spindle,

and said machine tool is devised so that interference of said turning tool rest with other members can be prevented by attaching said workpiece in a position that is separated by a specified distance toward the front of said main spindle.

11 (original): The multi-function machine tool according to claim 3, wherein
said workpiece attachment means can attach said workpiece in a position that is separated by a specified distance from said main spindle toward the front on the axial line of said main spindle,
and said machine tool is devised so that interference of said turning tool rest with other members can be prevented by attaching said workpiece in a position that is separated by a specified distance toward the front of said main spindle.

12 (original):. A machining method of a multi-function machine tool comprising,
a main spindle which is rotatably disposed on the bed of the machine tool, and has workpiece attachment means for attaching a workpiece on the tip end thereof,
a tool rest main body which is disposed movably in relative terms in a first linear direction parallel to the axial line of said main spindle, and in a second linear direction perpendicular to said first linear direction,
and a turning tool rest which is disposed on said tool rest main body, which allows the mounting of a tool, and which is disposed so that this tool rest can turn relative to said tool rest main body about a turning axis which has an axial line oriented in a direction that is perpendicular to both

said first linear direction and said second linear direction, said machining method comprising the steps of:

setting the center position of the turning motion that said tool mounted on said turning tool rest is caused to perform, in an arbitrary position that differs from the position of said turning axis;

determining the circular-arc motion based on the relative motion of said tool rest main body in said first linear direction and said second linear direction that is necessary in order to cause said tool to perform said turning motion; and

performing the machining of said workpiece by causing said turning tool rest to perform a turning motion about said turning axis, causing said tool rest main body to perform said circular-arc motion concurrently and synchronously with said turning motion of said turning tool rest, and causing said tool to perform said turning motion about said center position.

13 (original): The machining method of a multi-function machine tool according to claim 12, wherein said step of determining said circular-arc motion comprises the steps of:

setting a first dimension from the center position of the turning motion that said tool is caused to perform to the tip end position of said tool;

determining a second dimension from the center position of said turning motion to the center position of said turning axis; and

determining the radius, starting position and end position of said circular-arc motion from said second dimension and the starting angular position and end angular position of the turning motion that said tool is caused to perform.

14 (original): The machining method of a multi-function machine tool according to claim 13, wherein the step of performing the machining on said workpiece is a step of forming a helical groove in said workpiece while said workpiece is caused to perform a rotational motion about the axial line of said main spindle concurrently and synchronously with said turning motion and said circular-arc motion.

15 (original): The machining method of a multi-function machine tool according to claim 14, wherein the step of performing the machining on said workpiece is a step of performing a turning motion and a circular-arc motion which have different phase relationships with respect to the rotational motion of said workpiece, and performing groove machining with a groove width that is equal to or greater than the width of the blade part of said tool.